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ABSTRACT

Methods used to study the cost of public higher education in California were assessed, and eight limitations of previous studies were identified. The intent in reviewing cost-research methodology was to demonstrate that prior studies adopted a narrow approach to the topic. It was proposed that a study of costs must provide an overview of the whole system and must include as much of the total cost as possible. The original work deflated detailed costs for the California State University and the University of California for fiscal years 1970-1971 through 1982-1983. Full-time-equivalent students were adjusted because of changes in the distribution of academic level. It was found that, overall, expenditures per student unit averaged less than $3,000 over the 13-year period. To place costs in perspective, societal, political, and economic factors that helped shape the system were examined. In addition, California's total system of public education was compared to those of six other states. It was concluded that: costs can and should be studied; the task is not an easy one; calculations depend upon the researcher's interest; and a broad range of academic disciplines should be brought into the methodology of cost analysis. (Author/SW)

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The Costs of Higher Education in California: An Eclectic Approach

by

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THE ASSOCIATION FOR INSTITUTIONAL RESEARCH

This paper was presented at the Twenty-Fourth Annual Forum of the Association for Institutional Research held at the Hyatt-Regency in Fort Worth, Texas, May 6-9, 1984. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum papers.

Daniel R. Coleman, Chairman
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ABSTRACT

This study reports on the methods used to study the cost of public higher education in California. The original work deflated detailed costs for the California State University, and the University of California for Fiscal Years 1970-71 through 1982-83. FTE students were adjusted because of changes in the distribution of academic level. The study found that, overall, expenditures per student unit averaged less than $3,000 over the 13-year period. To place costs in perspective, societal, political, and economic factors that helped shape the system were examined. In addition, California's total system of public education was compared to six other states. It was concluded that 1) costs can and should be studied, 2) the task is not an easy one, 3) calculations depend upon the researcher's interest, and 4) a broad range of academic disciplines should be brought into the methodology of cost analysis.

INTRODUCTION

How much California's public postsecondary education costs has been a major topic of concern for at least 20 years. Although the State continues to express interest in costs, and research efforts exist, agreement about how much the system costs is lacking. Over the past two decades, California's legislature has called upon the statewide coordinating agency to conduct cost studies at least four times (California Postsecondary Education Commission, June 13, 1977). To date, the agency's attempts have not satisfied either the legislature or the educational segments. The coordinating body has been advising the State on segmental-budget requests since 1963 (Coordinating Council for Higher Education, 1963). It has conducted or has contracted for studies on 1) faculty compensation (e.g., California Postsecondary Education Commission, April, 1982); 2) the impact of student fees and tuition on enrollment (California Postsecondary Education Commission, February, 1980), 3) the cost-effectiveness of year-round operation (Coordinating Council for Higher Education, February, 1964; Touche, Ross, Bailey and Smart, September, 1968), and 4) student access (Coordinating Council for Higher Education, December 3, 1968; California Community Colleges, California State University, and the University of California Board of Regents, April, 1979).

ERIC contains over 200 references to the cost of California's public higher education. Many share a number of limitations:

1. Some researchers and the State legislature, assume that one single measure of educational cost can be calculated. (e.g., Coordinating Council for Higher Education, February 20, 1968; October, 1972; March, 1974; February, 1974). This has caused segmental resistance to such studies and refusals to accept their results.

2. Lack of easily-accessible, comparable data has caused researchers to use different bases of information of limited scope (Coordinating Council for Higher Education, February, 1963; Tool, 1966; Winslow, 1971; Oliver and Hopkins, July, 1971). Many studies have been discounted because of data incompatibility (Coordinating Council for Higher Education, February 20, 1968).

3. Per student cost calculations have been very limited, using mainly unweighted FTE students (Coordinating Council for Higher Education, February 20, 1968; Coordinating Council for Higher Education, October, 1972; Coordinating Council for Higher Education, March, 1973; California Postsecondary Education Commission, February, 1974). These results have not been accepted because they failed to consider differential costs among students' academic level and changes in the distribution of academic level.

4. Few researchers consider the effects on cost of the major factors that shaped the structure of California's postsecondary educational systems (Gerth and Grenier, approximately 1980; Coons, 1968; Almond and Smelser, 1974).

5. Most researchers limit their sample size (Heath, 1968; Winslow, January, 1971;). This has led to limited generalizability of results.

6. Most studies have concentrated on annual costs (e.g., California Postsecondary Education Commission, April, 1982). This has prevented examination of trends in cost (Coordinating Council for Higher Education, October, 1972).

7. Few studies discuss the impact of inflation on costs. The news media reports current dollars (e.g., Roark, February 18, 1983; Speich, October 26, 1978). Californians have received inflated cost information.

8. Quality has been defined as economic returns to students (Coordinating Council for Higher Education, May, 1965; California Postsecondary Education Commission, February, 1980), as inputs into the system, e.g., number of faculty, or as the process, such as student-faculty ratios. These steps are premature, since higher education has not yet defined its product.

The study of cost cuts across many academic disciplines; aspects of Accounting, Economics, History, Psychology, Sociology, Political Science, and Education are all applicable; few researchers have recognized this.

The current study attempted to avoid most of the limitations noted above. It began with these assumptions: 1) costs can and should be studied; 2) calculations depend, in large measure, upon the audience; and, 3) the condition of education should be examined over time and compared to other states.

METHOD

Primary data sources where used whenever possible. Data from the Digest of Educational Statistics (National Center for Education Statistics, 1971 through 1982) were used to compare California's total public educational effort to six other states, called "The Others" for convenience, and to the nation. Major societal, political, and economic factors were identified from the literature. Expenditure data for the University of California were gathered from Campus Financial Schedules (University of California, 1970-71 to 1982-83, annually), and for the California State University from Detailed Budget Allotments: Final Budget (California State University, 1973-74 to 1983-84, annually). Data were detailed by year, campus, fund, program, and object category.

RESULTS

The condition of California's public educational system

Data summarizing comparisons between California, six comparable states, and the nation are shown in Table 1.

Insert Table 1 here

Four hypothetical propositions were tested:

1. "The system doesn't work!"

Illiteracy. In 1900, 5.3% of Californians were illiterate; by 1970, this figure had decreased to 1.1%. The average percent illiterate of The Others and nationally also decreased from 9.9% to 1.2%, and 11.3% to 1.2%, respectively. However, California's national ranking over the 70 years dropped from 13th to 27th. In part, this may be a function of increases in ethnic minority enrollment.

Minority enrollment. In 1976, Hispanics and Asians constituted over 10% of California's public schools enrollment; by 1980, these minorities accounted for almost 13% of the total. About one-third of all Hispanic and Asian students are enrolled in California. Some of those students surely require special assistance with the language. It is also possible that shifting demographics affected California's literacy effort.

Demographics. California's postsecondary institutions continue to attract more students from other states than they

lose. This is not true for most of The Others. Perhaps for financial reasons, nationally, the ratio of first-time students enrolled in their home state increased from .84 in 1968 to .88 in 1979.

However California's percent of residential enrollment exceeded all other states between 1968 and 1979.

2. "Declining enrollments threaten the system's existence!" California experienced a decline in enrollment between 1970 and 1979; so did The Others and nation. In all three cases the loss was confined to primary and secondary enrollments; postsecondary enrollment increased.

3. "The system is going broke!"

One of the better measures of financial stability may be funding per enrollment, although enrollment does not equal full-time-equivalent students. Funding per enrollment seems to be a better measure than annual change in total dollars. The rate of increase of funding per enrollment in California between 1977 and 1978, 5.2%, exceeded the average of The Others, 0.8%, and the national average, 2.0%.

4. "Teachers are overworked and underpaid!"

A commonly-used measure of instructor's workload is the number of students enrolled per faculty member. This figure omits important workload components; class preparation, and supervision of extracurricular activities, for example.

However, if the ratio of students to teacher is accepted as one indicator of effort, California's public primary and secondary school teachers began and ended the decade responsible for, on the average, more students, 24.0 and 20.8, than either the national average, 22.3 and 19.0, or the average of The Others, 21.7 and 19.5. However, California's ratio of pupils per teacher declined by 3.2 students between 1970 and 1979, more than the national average or that of The Others.

A second measure of effort may be reflected in compensation. Averages, used here, are subject to error, primarily because they exclude differential rates of cost of living. However, in 1939, the median income of California's public school staff was $14,569; in 1979 it was $20,779. Nationally, these figures were $8,930 and $18,270. The average salary of The Others was $9,871 and $19,272.

5. "The public doesn't care about education!"

A direct measure of the public's support of education is trends in personal income devoted to education. This percentage declined between 1970 and 1979; in California from 7.3% to 5.6%; in The Others, 6.3% to 4.5%; and nationally, from 6.5% to 5.5%. This may be a function of changing social priorities and eroding tax bases. However, Californians devoted a larger percentage of their income to education, both at the beginning and end of the decade than either the

average of The Others or than the national average.

Californians' per capita income increased by 2.2% between 1970 and 1979. National per capita income increased by 2.2% as well, while the increase in The Others averaged 2.0%. The average amount of personal income devoted to education in California increased from $326 in 1970 to $550 in 1979. In 1979, two of the six states exceeded California's figure. Finally, in 1979, the average amount of personal income devoted to education per enrollment in California, $52, was exceeded by two of the other states and equalled by a third.

Factors that have helped shape public higher education in California

Five major factors have had considerable impact, directly or indirectly, on the funding and cost of California's public colleges and universities. These factors, and this author's subjective evaluation of their impact on educational costs are shown in Table 2.

Insert Table 2 here

The Morrill Act of 1862 led to constitutional status for the University of California. The Act assured funding sources to the University. Constitutional status afforded the University considerable fiscal flexibility.

Institutions that ultimately formed the California State University were limited to teacher preparation. In 1935, the Legislature permitted them to broaden their programs slightly. This may have led to formalizing the State University in 1960. By 1970, California's General Fund commitment to the State University was $335 million.

California's Master Plan for Higher Education was designed to bring order to the growth of public higher education. The Plan established the California State Colleges. Financially, the State Colleges remained subject to State agencies. The system is not permitted to offer doctoral, law or medical programs, nor is it funded for faculty research beyond negligible amounts. When compared to the University, the State University has been unable to secure many large public and private grants and contracts.

One of the sections of The Master Plan established a group to mediate between the segments and the legislature. The coordinating body has had more impact on the State University than on the University of California. The University remains relatively autonomous while the State University remains fairly tightly controlled.

The student riots of the 1960s were a major factor in the election of Ronald Reagan as California's Governor (Speich and Weiner, 1980). The Governor's budget reductions had an

immediate impact on both senior segments. The student revolts also caused the control agencies to increase their fiscal scrutiny. The budget reductions led many to believe that education could operate cheaper with no decrease in quality. Proposition 13 may reflect public punishment of California's higher education for the student riots.

Proposition 13 caused additional budget reductions (e.g., Roark, June 12, 1983; Lazare, March 6, 1983; Kissler, 1980; Gerth and Grenier, undated.) Some argue that it forced educators into a serious planning mode (Loyd, 1981; Pickens, 1981; Jolly, 1979). A review of Los Angeles Times' coverage of Proposition 13 during 1978 found 1) educators' dire predictions did not diminish voter's support for Prop 13, 2) 70% of those polled after voting believed that educational services would not be reduced, and 3) no evidence that reductions in educational services did occur was made public.

The cost of higher education in California

A summary of these data are shown in Table 3.

Insert Table 3 here

If cost studies 1) fail to account for inflation by deflating costs, and 2) fail to adjust FTE students because of changes in the distribution of academic level, some erroneous conclusions can be drawn. Examination of current expenditures per FTE student shows that California's

education costs in the two four-year segments almost tripled between 1970 and 1982, from about $4,000 to more than $11,000 per FTE student. However, constant (1970 = 100) expenditures cost per adjusted FTE student show that costs remained below $3,000 during this time.

Data on funding source show that educators augmented public funding with private funds. Non-public funding increased from 20% of the total in 1970 to about 35% in 1982.

Different costs per student unit are a function of selecting subsets of total cost. Differences can be used to satisfy different organizational requirements. This is valid only if detailed calculations begin with the same base of data. When limited to General Fund, Instructional expenditures for non-compensation purposes, California expended $133 per student unit in 1982, although per student costs totalled $2,940.

Quality

No literature was located that attempted to measure quality under Bowen's (1977) definition, i.e., changes in students. All school and college deans in both four-year segments were asked to send this author examples of quality measurement. Only one campus attempts to measure changes that occur in students as a result of education. Others confused the quality of the output with inputs, such as amount of funding

or number of faculty, or the process, e.g., the ratio of students to faculty, or student evaluation of faculty. The quality of public higher education in California has not been determined. Funding requirements can not be accurately calculated.

CONCLUSION

This paper was more concerned with presenting cost-research methodology than results. While important, cost data presented here are somewhat incidental. The intent was to demonstrate that prior studies adopted a narrow, almost parochial approach to the topic. Even if ultimately concerned with the costs of one segment or campus, a study of costs must provide an overview of the whole system and must include as much of the total cost as possible if the results are to have any long-term value.

This approach creates a substantial, direct workload for researchers. Data gathering and input are often perceived as the least desirable components of research. Data entry is a laborious task. However, once completed, the researcher will have constructed a data base in which confidence can be placed.

A historical investigation of the events leading to the current state of the campus, system or state in question is helpful when explaining quantitative results. There is little meaning in simply finding that costs changed between

Year A and Year B.

Deflating costs and adjusting enrollment for shifting distributions of student level, are quite mechanical, and pose no great difficulty for the researcher. There may be questions about weighting enrollment, but, in a relative sense, "tweaking" will have little effect on campus or system results.

Researchers must extend their efforts beyond their own disciplines. Costs will be studied and values will be placed on education. These events have taken place for a very long time, perhaps when formalized education began. But, as education permeates more and more of our lives, education's responsibilities to its "customers" will increase; researchers must accept large portions of these responsibilities.

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Table 1. Summary of data on the condition of California's public educational system compared to national data.

Percent illiterate	1900 5.3%	1979 1.1%	National rank	1900 23	1979 27
Hispanic/Asian head coun. (thousands)	1976 1,035	1980 1,262	National rank	1976 1	1980 1
Net head count in higher education due to migration	1968 12,088	1979 35,179	National rank	1968 11	1979 1
Resident to total head count	1968 .94	1979 .96	National rank	1968 1	1979 1
Elementary/secondary headcount (millions)	1970 4.6	1979 4.0	National rank	1970 1	1979 1
Postsecondary headcount (millions)	1970 1.1	1979 1.5	National rank	1970 1	1979 1
Percent of change in constant (1967) revenues of public education (billions), 1978-79 to 1979-80	1978-79 to 1979-80 3.5%		United States	1978-79 to 1979-80 0.4%	
Constant (1967) current-fund revenues per head count	1978 $1,130	1979 $1,189	United States	1978 $1,134	1979 $1,157
Pupils per teacher	1970 22	1979 21	United States	1970 22	1979 20
Average salary, (constant 1980 dollars) public elementary/secondary staff	1939 $14,569	1979 $20,779	United States	1939 $8,930	1979 $18,270
Percent of personal income devoted to public education	1970 7.3%	1979 5.6%	United States	1970 6.5%	1979 5.5%
National rank of percent of personal income devoted topublic education	1970	1979		1970	1979
Primary/secondary	20	45	Postsecondary	6	9
Per capita income	1970 $4,469	1979 $9,825	National rank	1970 9	1979 5
Average amount of personal income devoted to public education	1970 $326	1979 $550	United States	1970 $254	1979 $475
Average amount of personal income devoted to public education per state & local revenue per head count	1970 $51	1979 $52	United States	1970 $49	1979 $52

Source: Digest of Educational Statistics, National Center on Educational Statistics, 1970; 1971; 1980; 1981.

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Table 2. Impact of political/societal/economic factors on the cost of California's public higher education.

Factor	Result	Impact
MORRILL LAND GRANT BILL	Constitutional status -- University of California	1. Funding assurances for UC; 2. Fiscal flexibility for UC; 3. Autonomy for UC; and, 4. Political power for UC.
RENAMING STATE TEACHER'S COLLEGES TO STATE COLLEGES	State Colleges able to offer Liberal Arts courses	1. Student demand increased; 2. Cost to State increased; 3. Expansion assured; and, 4. CSU - UC clash inevitable.
MASTER PLAN ESTABLISHED	Defined segments' roles	1. Assured cost disparity between segments; 2. Limited CSU's authority; 3. Limited CSU's fiscal authority;
COORDINATING BODY ESTABLISHED	Rigidity increased	1. Decreased CSU's power base; 2. Reduced CSU's political power; and 3. Increased scrutiny of UC.
STUDENT REVOLTS	Damaged segments' reputations	1. Helped elect Gov. Reagan; 2. Caused firings of administrators; 3. Led to budget reductions; 4. Caused loss of public support; 5. Caused loss of political power; 6. Increased scrutiny; and 7. Reduced fiscal flexibility.
PROPOSITION 13	Damaged segments' social/political/economic position	1. Budget requests' integrity reduced; 2. Loss of public support; 3. Loss of political power; and, 4. Fiscal flexibility reduced.

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Table 3. The condition of The University of California and the California State University, and estimated minimal cost per student unit.

	Per student unit		
	1970	1982	Estimated minimal cost, 1982
Current expenditures (constant 1970 dollars)			
Total	$2,417	$2,940	$2,941 - $3,765
Univ. of Calif.	4,196	5,361	
Calif. St. Univ.	1,304	1,332	
UC minus CSU	$2,892	$4,029	
Current Instructional expenditures for Salaries and Benefits (constant 1970 dollars)			
Total	$ 892	$2,235	$2,560 - $3,057
Univ. of Calif.	1,131	2,622	
Calif. St. Univ.	736	738	
UC minus CSU	$ 395	$1,884	
Current Instructional Operating Expenses and Equipment expenditures (constant 1970 dollars)			
Total	$ 95	$ 449	$ 381 - $ 708
Univ. of Calif.	185	1,055	
Calif. St. Univ.	39	31	
UC minus CSU	$ 146	$1,048	

Source: Minimal costs based on Bowen (1980), p. 238